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(71) Applicant (for all designated States except US):
FAGERDALA TUOTANTO OY [FI/FI]; Väkkärän-
tie 97, FIN-23800 Laitila (FI).

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(72) Inventor; and

(75) Inventor/Applicant (for US only): **LAAKSONEN, Kari**
[FI/FI]; Perkontie 124, FIN-23800 Laitila (FI).

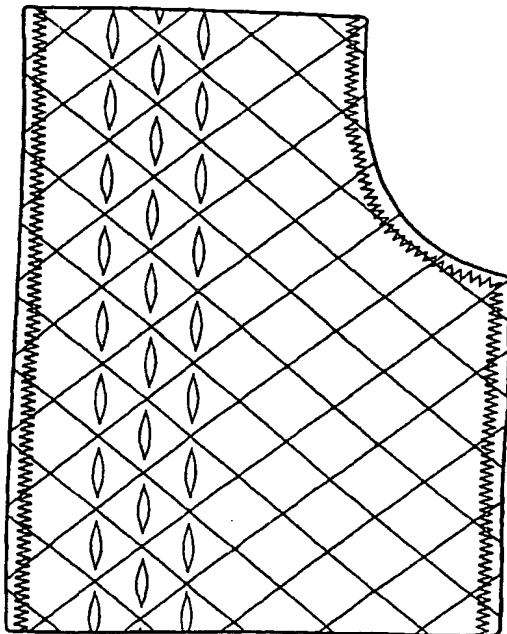
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(74) Agent: **LAITINEN, Pauli, S.**; Patentti-Laitinen Oy, P.O.
Box 29, FIN-02771 Espoo (FI).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A BREATHABLE GARMENT OR PROTECTIVE DEVICE AND THE USE THEREOF



(57) Abstract: The invention relates to an accessory, such as a flotation device, shin guard, or other accessory absorbing impact, which is formed from a cut cellular plastic sheet (3) and a support fabric (2). The cellular plastic sheet (3) and the support fabric (2) are attached to each other at the opposite edge area of the accessory or a part of it, or are laminated to each other in a stretched state. The accessory is of such a size in its free state that, when it is put onto its object of use, the accessory is always made to stretch, so that the cuts in the cellular plastic open to make the construction breathable.

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A breathable garment or protective device and the use thereof

The present invention relates to an accessory, such as a flotation device, which may be, for example, a jacket, but which may also be a device with another shape. The accessory according to the invention is also suitable for use, for example, as a piece of sports equipment with impact absorbing properties, or even as only a warming accessory. The accessory according to the invention is suitable for use both beneath outer clothing and as outer clothing.

For example, there are several different known variations of accessories used as flotation jackets. All of them, however, have the common feature that they are formed of a jacket component made of cloth, with flotation material placed in pockets formed in the jacket component. This construction has the drawback of having a closed form, which makes the jacket sweaty, thus raising the threshold to using it, as the wearer finds it unpleasant.

A construction of the above type is used in other applications too. One such example is the impact absorbing construction applied, for instance, in protective devices used in sports, for both people and animals, such as horses. In these cases too, the constructions are generally closed and sweaty.

Finnish patent application 972210 discloses a cellular plastic material, which has cuts made in it, so that, when a sheet of the material is spread out, the cuts open to form openings in the material, in order to reduce sweatiness. An improved version of this is disclosed in Finnish patent application 19992145, in which a hole is also added to the cuts.

The present invention is intended to exploit the cut material in accessories, so that the breathability of the accessory will improve, making it more comfortable to use. It can then be assumed that the accessory will be used more generally than at present.

In the following, the invention is examined with reference to the accompanying drawings, which show part of an accessory used as an example, a jacket in the 'resting position' and in the 'wearing position'.

Thus:

Figure 1 shows one piece of a jacket, for example, a piece on the side of the chest of the user, in the state in which the jacket is stored and a cross-section A - A of it; and

Figure 2 in turn shows the said part of the jacket in the 'wearing position', i.e. in the position in which it is when on the wearer.

The part 1 of the jacket shown in Figures 1 and 2, which in this case is the left-hand chest piece, is attached to the other parts of the jacket, which are not shown here, to form an entire jacket, which is particularly equipped with suitable fasteners, for example a zip fastener or similar, between the chest pieces, to form a construction that will remain firmly on the wearer.

When the jacket is not on its wearer, its extent is clearly smaller than when it is being worn. This is shown in Figure 1, in which the part of the jacket is formed from a cellular plastic sheet 3, inside a flexible, possibly mesh-like fabric, which is shown in the figures by cross-hatching 2, there being cuts in the sheet, which can be, for example, essentially cuts running in one direction, with the adjacent rows of cuts partly interlocking with each other. The cuts can also be combinations of holes and cuts, or even combinations of several cuts starting from essentially the same point. In Figure 1, the cuts are only shown schematically by vertical lines.

A basic idea of the invention is that the cellular plastic sheet 3 is stitched, or otherwise attached to the fabric 2 close to the edge. In Figure 1 and cross-section A - A, the stitching is shown by the reference numbers 4 and 5.

When the wearer puts the jacket on, the parts of the jacket must stretch, so that the jacket will fit onto the wearer. The fact that the sheet 3 of cellular plastic

material is attached at its edges to the fabric 2, means that the material 3 must stretch in a lateral direction, in which case the cuts will open essentially over the entire length of the part, making the material breathable. At the same time, when the accessory is formed of more than one piece, an adjustable joint can be arranged between the pieces. It is then possible to use, for example, a joint tied with laces, which can be tightened or loosened by means of the length of the lace. Thus, the basic adjustment of the accessory by laces permits the material sheet 3 to stretch and the opening of the cuts to be adjusted as desired.

Because the surface material of the jacket is fabric, which stretches easily, and, being a light and possibly open-weave fabric, does not an obstacle to breathability, the surface material permits the cellular plastic material to be spread freely, in order to open the cuts. This is also made possible because, unlike in known flotation and similar jackets, the cellular plastic in this case is not loosely placed in a pocket formed by the fabric, instead its edges are sewn onto the fabric, thus also creating stretching in the cellular plastic sheet. Thus, putting on the jacket automatically creates a breathable construction.

Alternatively, the cellular plastic layer and the supporting fabric can be attached to each other by laminating the supporting layer onto the cellular plastic layer. Lamination is carried out by stretching both the supporting layer and the cellular plastic layer during the laminating stage, so that the cellular plastic is open. When the stretching forces are released after lamination, the construction closes, but can naturally be stretched again when placed in its wearing position.

It is obvious that many different fabrics, which permit stretching and, on the other hand, do not themselves create an obstacle to breathability, can be used as the surface material. Various kinds of eyelet fabrics, mesh-like fabrics, and similar are highly suitable for this purpose.

There are also quite many flotation, or impact absorbing, or similar cellular plastic materials, and in this case there is no intention to limit these in any way, either in terms of the plastic or plastic compound used, or in relation to the density or other properties of the material.

As has already been made apparent, the invention is extremely suitable as a flotation device, for example, as a jacket, so that it can be used as a jacket under, for example, a piece of outer clothing, such as a raincoat. The jacket-like accessory is also highly suitable for use for many purposes, in which impact absorption is important. One such use is impact absorption in sports situations, in accessories like an ice-hockey goalkeeper's body pad. An accessory according to the invention can also be used on animals. Indeed, one purpose is as collision and impact protection, for example, for horses, for which present day regulations require protectors to be used.

It is obvious, that the accessory, which is disclosed here, can also be shaped like any other accessory, such as a shin guard or similar, so that the invention will alleviate the problem of sweating in that case too. In all cases, it is essential that, in its basic state, the accessory is 'tight', so that it is forced to spread when used, and that the construction is made in such a way that it allows the accessory to be spread out, while simultaneously spreading a non-sweaty material in place of a sweaty material.

Many different variations are possible while nevertheless remaining within the scope of the inventive idea and the accompanying Claims. For example, the support fabric may be only on one side of the cellular plastic layer, in which case the amount of material required will be small compared to known solutions. This one-sided construction is possible, because the fabric and cellular plastic layers are attached to each other.

Claims

1. An accessory, such as a flotation jacket, shin guard, or other impact absorbing device, or a part of it, which is formed of a cut sheet (3) of cellular plastic material and a flexible support fabric (2), **characterized** in that the size of the accessory in a free state is such that putting the accessory onto its object of use always causes the accessory to stretch, so that the cuts in the cellular plastic open to make the construction breathable.
2. An accessory according to Claim 1, **characterized** in that the cellular plastic sheet (3) and the support fabric (2) are attached to each other at least at the opposite edge areas of the accessory, or the part of it.
3. An accessory according to Claim 1, **characterized** in that the cellular plastic sheet (3) and the support fabric (2) are laminated to each other in a stretched state.
4. An accessory according to Claim 1, **characterized** in that the support fabric (2) is of a mesh-like type, or is otherwise of an easily stretched material that is easily permeated by air.
5. An accessory according to Claim 1, **characterized** in that it is formed from a cellular plastic sheet (3) with a support fabric (3) on one side of it.
6. An accessory according to Claim 1, **characterized** in that it is formed from a cellular plastic sheet (3) with a support fabric (3) on both sides of it.
7. An accessory according to any of the above Claims, **characterized** in that the cellular plastic sheet and the support fabric are sewn onto each other.
8. An accessory according to any of the above Claims, **characterized** in that the accessory is formed of at least two parts, which are attached to each other in an adjustable manner.

9. The use of an accessory according to any of the above Claims in flotation jackets, shin or other guards, and in other devices for absorbing collisions or impacts on people and animals.

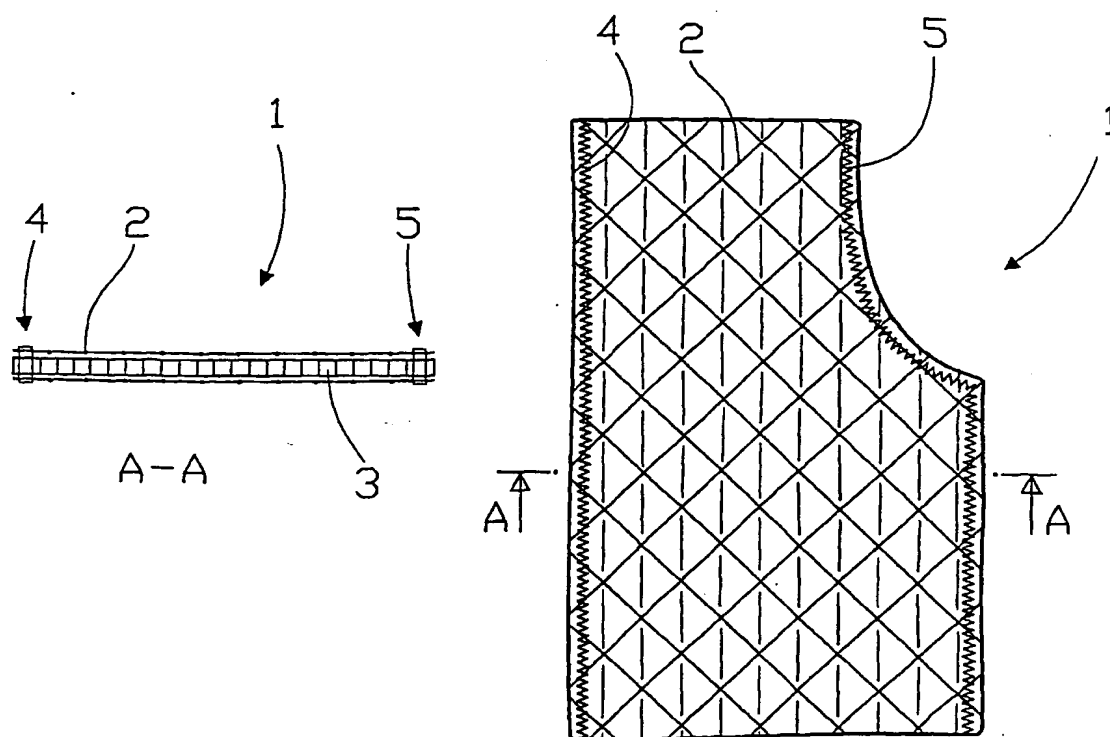


Fig.1

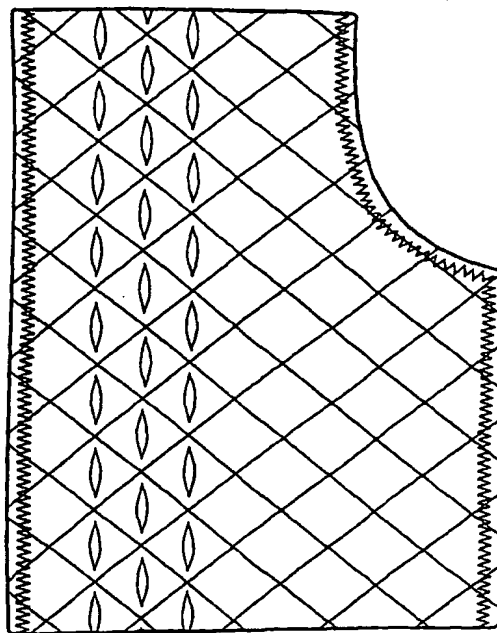


Fig.2



✉ EPA/EPO/OEB
D-80298 München

☎ +49 89 2399-0
TX 523 656 epmu d
FAX +49 89 2399-4465

**Europäisches
Patentamt**

Generaldirektion 2

**European
Patent Office**

Directorate General 2

**Office européen
des brevets**

Direction Générale 2

Laitinen, Pauli Sakari
Patentti-Laitinen Oy, P.O. Box 29
02771 Espoo
FINLANDE

Telephone numbers:

Primary Examiner +49 89 2399-7516
(substantive examination)

Formalities Officer / Assistant +49 89 2399-2746
(Formalities and other matters)



Application No. 01 983 622.0 - 2314	Ref. 987ASU	Date 24.08.2005
Applicant Fagerdala Tuotanto Oy		

Communication pursuant to Article 96(2) EPC

The examination of the above-identified application has revealed that it does not meet the requirements of the European Patent Convention for the reasons enclosed herewith. If the deficiencies indicated are not rectified the application may be refused pursuant to Article 97(1) EPC.

You are invited to file your observations and insofar as the deficiencies are such as to be rectifiable, to correct the indicated deficiencies within a period

of 4 months

from the notification of this communication, this period being computed in accordance with Rules 78(2) and 83(2) and (4) EPC.

One set of amendments to the description, claims and drawings is to be filed within the said period on separate sheets (Rule 36(1) EPC).

Failure to comply with this invitation in due time will result in the application being deemed to be withdrawn (Article 96(3) EPC).



Pollet, D
Primary Examiner
for the Examining Division

Enclosure(s): 5 page/s reasons (Form 2906)

**Bescheld/Protokoll (Anlage)**

Datum
Date 24.08.2005

Communication/Minutes (Annex)

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Notification/Procès-verbal (Annexe)

Anmelde-Nr.:
Application No.: 01 983 622.0
Demande n°:

The examination is being carried out on the **following application documents**:

Description, Pages

1-4 as published

Claims, Numbers

1-9 as published

Drawings, Sheets

1/1 as published

1. The following documents (D) are referred to in this communication:

D1: GB-A-2 312 643

D2: WO-A-98 53980

2. *Lack of clarity*

The application does not meet the requirements of Article 84 EPC, because claims 1, 2 and 4-8 are not clear.

The matter for which protection is sought is not defined in claim 1. The claim attempts to define the subject-matter in terms of the result to be achieved ('...so that the cuts in the cellular plastic open to make the construction breathable'). Such a definition is only allowable under the conditions elaborated in the Guidelines C-III, 4.7. In this instance, however, such a formulation is not allowable because it appears possible to define the subject-matter in more concrete

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Datum
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Notification/Procès-verbal (Annexe)

Anmelde-Nr.:
Application No.: 01 983 622.0
Demande n°:

terms, viz. in terms of how the effect is to be achieved. Moreover, it is clear from the description that the following features are essential to the definition of the invention:

- (1) the sheet of cellular plastic and the support fabric are "attached" to each other; and
- (2) the support fabric is stretchable and air permeable.

Since independent claim 1 does not contain these features it does not meet the requirement following from Article 84 EPC taken in combination with Rules 29(1) and (3) EPC that any independent claim must contain all the technical features essential to the definition of the invention. In addition, the term *cut sheet* is vague and unclear and leaves the reader in doubt as to the meaning of the technical feature to which it refers (i.e. a sheet cut to size or a sheet with cuts or slits). Note also that the expression "such as" has no limiting effect on the scope of the claim; that is to say, the features following this expression are to be regarded as entirely optional (see the Guidelines C-III, 4.6).

In claim 2 it is unclear what is meant by '...at least at the opposite edge areas? of the accessory or the part of it'.

The relative wording *easily stretched* and *easily permeated by air* used in claim 4 is vague and unclear and leaves the reader in doubt as to how easily the material is stretched or permeated by air.

The features of claim 5 are already present in independent claim 1. Hence, the claim is superfluous.

In claim 6 the features of a cellular plastic sheet and a support fabric are already defined in claim 1.

Claim 7 defines an accessory *according to any of the above claims* (e.g. claim 6) wherein the cellular plastic sheet and *the support fabric* are sewn onto each other. However, in claim 6 *two support fabrics* are defined.

**Bescheid/Protokoll (Anlage)**

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Communication/Minutes (Annex)

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Notification/Procès-verbal (Annexe)

Anmelde-Nr.:
Application No.: 01 983 622.0
Demande n°:

The matter for which protection is sought (two parts? which are attached to each other in an adjustable manner?) is not clearly defined in claim 8.

3. *Lack of inventive step*

- 3.1 The present application does not meet the requirements of Article 52(1) EPC, because the subject-matter of claims 1 and 9 does not involve an inventive step in the sense of Article 56 EPC.

Document D1, which is regarded as being the closest prior art, discloses an accessory, such as an impact absorbing device (p. 3, l. 17), which is formed of a cut sheet (2) of cellular rubber material (i.e. foam rubber) and a flexible support fabric (1, 3). The size of the accessory in a free state is such that putting the accessory onto its object of use always causes the accessory to stretch, so that the cuts (21) in the foam open (21') to make the construction breathable (see Fig. 3; p. 3, l. 20-24). The subject-matter of claim 1 merely differs from this known device in that the material is a plastic material.

It is however generally known to the person skilled in the art that the slitted rubber foam of document D1 is an equivalent to the slitted cellular plastic sheet of document D2 and can be interchanged with that feature where circumstances make it desirable. Note that according to the present application (p. 3, l. 27-30) the type of material is not critical. Moreover, the material of D2 is also used as impact-absorbent in sportswear (see p. 1, l. 6). The subject-matter of claims 1 and 9 does therefore not involve an inventive step.

Note also that according to D2 (see p. 3, l. 25-29) the cuts can be made into the cellular plastic material after lamination. Hence, in use the cuts in the material will open and make the construction breathable!

- 3.2 Dependent claims 2-8 do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the EPC with respect to inventive step. The features herein disclosed appear to be merely some of several constructional possibilities from which the person skilled in

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Notification/Procès-verbal (Annexe)

Anmelde-Nr.:
Application No.: 01 983 622.0
Demande n°:

handwritten amendments are submitted, they should be clearly legible for the printer.
According to the decision of the President of the EPO under Rule 35(2) EPC (OJ EPO 12/2001, 563) one set of the amended documents of the European patent application shall be provided.